



PHILIP MORRIS  
EUROPE MIDDLE EAST AFRICA  
RESEARCH AND DEVELOPMENT

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*Charles* } F.C.I.  
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## Monthly Progress Reports

Strictly Confidential

JANUARY 1981

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PROJECT TITLE : PRODUCT RESEARCH  
PERIOD COVERED : JANUARY 5 - 28, 1981  
WRITTEN BY : Y. GENOUD

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#### ADSORBENTS

On the request of Product Development, a new type of ion exchange resin was investigated (1).

Name of resin : Duolite A7  
Reference : D.E. 0.10.7031, batch 10  
Manufacturer : Dia-Prosim, Vitry (France).

#### Characteristics

Specific surface :  $114 \text{ m}^2/\text{g}$   
Volume of mesopores :  $0.12 \text{ cm}^3/\text{g}$   
Volume of micropores :  $0.12 \text{ cm}^3/\text{g}$   
Water content : 55%

#### Retention of gas-phase components by Duolite A7

- No specific retention of organic components.
- Best efficiency for the volatile aldehydes acetaldehyde, propion aldehyde, acroleine and 3-methyl butanal (30-40% reduction).
- Low efficiency for the other organic smoke components (10-25% reduction).
- No retention of furanes (furane, 2-methyl furane, 2.5 - dimethyl furane) and isoprene.

#### CONTAMINATED MLK-UK

Samples of contaminated MLK-UK manufactured in Holland and packed with British soft labels were submitted by QC (2) for pin-pointing contamination. Since unpacked samples and samples packed with French labels were not contaminated those packed with British and French labels, including the inks and varnishes used, were analysed by GC (3).

#### Results of investigations (4)

- The components and quantity of compounds in French and British labels are identical.
- Inks and varnishes used for both labels are identical.
- No differences in chromatograms of the volatile portions of MLK-UK samples packed with French or British labels could be detected, neither by using headspace techniques nor by solvent extraction.

In addition to analysis, cigarettes from several contaminated packages were smoked. A peculiar taste was noticed immediately after the samples were received. However, after some days of storage there was no taste difference found between contaminated and normal MLK-UK samples.

#### REPORTS WRITTEN

- "The Analysis of the Gas Phase of Cigarette Smoke by Capillary Gas-Chromatography (GC)", Technical Report.
- "The Analysis of Triacetin in Filter Material by Capillary Gas-Chromatography (GC)", Analytical Method.

#### REFERENCES

1. Memo from B. Krasna to Y. Genoud, November 19, 1980.
2. Memo from F. Lopes to W. Fink, November 20, 1980.
3. Y. Genoud, PME Research Lab., Monthly Progress Report, November 1980.
4. Y. Genoud report to F. Lopes, January 22, 1981.

Y. Genoud

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PROJECT TITLE : ANALYTICAL INVESTIGATIONS  
PERIOD COVERED : JANUARY 5 - 28, 1981  
WRITTEN BY : E. LECOULTRE

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#### PRODUCT IDENTIFICATION BY GC<sup>2</sup>/MS

- A "ghost-peak" which is permanently found in the routine analysis of minor tobacco alkaloids by GC has been identified as anti-oxidants BHT (2,6-di-tert-butyl-4-methyl phenol).
- The purity of a new type of Eastmans Estrobond B has been checked for QC (1). GC<sup>2</sup> analysis shows, in addition to the GPD isomer mixture, a series of contaminations not found in Estrobond B used so far. Identification of compounds by GC<sup>2</sup>/MS is in progress.

#### ORGANIC ACIDS BY GC

The procedure for the formation of ethyl esters of mono-di- and tri-carboxylic acids described by Gloor et al (2) has been investigated (3). After some modifications the ethyl esters of acetic, citric, lactic, malic, succinic fumaric, tartaric and pyruvic acids are now formed in high yield. Separation of esters by GC<sup>2</sup> has been completed. Quantitation of the method is in progress.

#### REFERENCES

1. Memo from A. Widmer to Y. Genoud - January 19, 1981.
2. R. Gloor and H. Leidner, Chromatography, 9, 618 (1976).
3. E. Lecoultre, PME Research Laboratory, Monthly Progress Report - December 1980.

E. Lecoultre

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PROJECT TITLE : BIOTECHNOLOGY  
PERIOD COVERED : JANUARY 1981  
WRITTEN BY : D. SCHULTHESS

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#### NITRATE MONITORING

The system for a continuous nitrate measurement and a controlled glucose addition to tobacco extracts was installed and is working (1).

#### TWO STAGE DENITRATION (2)

A normal NINO denitration of a tobacco extract containing 1118 ppm  $\text{NO}_3^-$  - N was run in a first fermenter. The dilution rate was set at  $0.2 \text{ hr}^{-1}$ . The denitrated extract was continuously pumped into a second fermenter and mixed with the same amount of untreated extract. The total flow into the second fermenter corresponded to a dilution rate of  $0.11 \text{ hr}^{-1}$  and had a nitrate - nitrogen content of 546 ppm. No additives were supplied.

In the second fermenter another 180 ppm  $\text{NO}_3^-$  - N were eliminated. Thus the total extract, that had been treated in the two fermenters, had a nitrate reduction of 67%. However the amount of glucose used would give only a 50% reduction in a one-fermenter denitration.

The second fermenter could also be emptied each time, as soon as it was filled. In this fed-batch system the total nitrate reduction rose to 76%.

Trials continue to improve this process.

#### REFERENCES

1. M. Thévoz, Monthly Report - Instrumentation and Process Automation, January 1981.
2. JBE - Notebook 800802, p. 30 - 34.

*Schulthess*

D. Schulthess

PROJECT TITLE : PROTAGORAS  
PERIOD COVERED : JANUARY 1981  
WRITTEN BY : D. SCHULTHESS

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#### OPTIMIZATION OF PROTEIN EXTRACTION

In order to optimize the extraction of proteins from tobacco the influence of the following parameters have been tested : pH, temperature of extraction, time of extraction, and quantity of enzymes used. In each trial only one parameter was changed using the following basic conditions :

Tobacco : 20g B - Blend, Project Spotless  
Water : 200 ml  
Enzyme : Pronase (Boehringer)  
Enzyme quantity : 150 mg  
pH : 7.5  
Temperature : 37°C  
Time : 6 hours

#### pH

The optimal activity of the pronase lies between pH 6.8 and 8.3. At lower pH levels less proteins are extracted. At higher pH levels the activity of the enzyme decreased. At pH levels of around 10, more proteins were extracted than at pH 7.5, due to a chemical hydrolysis and not to a higher enzyme activity (1).

#### Enzyme Quantity

Without enzyme, 33% of the tobacco proteins were extracted. This value increases to 65%, if 150 mg pronase are used. Higher amounts of pronase do not improve the result. Lower quantities give a less efficient protein extraction (2).

#### Temperature of Extraction

The optimal extraction temperature lies between 37°C and 50°C. Higher or lower temperatures result in a less efficient protein extraction (3).



# 7

## Time of Extraction

Initially the 6 hours of extraction were chosen arbitrarily. Trials showed that higher extraction times do not improve the result. The extraction time may even be reduced to 3 hours without any loss of efficiency (4).

## REFERENCES

1. A. Hänggi - Notebook 79 1201, 33 - 36
2. A. Hänggi - Notebook 79 1201, 39
3. A. Hänggi - Notebook 79 1201, 37
4. A. Hänggi - Notebook 79 1201, 38 - 40

*Schulthess*

D. Schulthess

PROJECT TITLE : SAVOURY  
PERIOD COVERED : JANUARY 1981  
WRITTEN BY : P. GHISTE

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#### FLAVOUR EVALUATION

The conditions for the olfactory evaluation of burley tobacco, RL and RL sprayed with reaction flavours are set as follows :

Oven temperature : 300°C  
Oxygen : 20% (air)  
Flow rate : 200 ml/min

The desired tobacco temperature was reached after 2.5 min.

These conditions are the results of various trials at different flow rates and temperatures. All persons who made the test expressed the opinion that the characteristic burley flavour was best noticed under these conditions.

#### PRODUCTION OF REACTION FLAVOURS

Four non enzymatic browning reactions were produced using the following conditions : (See Table 1 overleaf).

P. Ghiste

PRODUCTION OF REACTION FLAVOURS

Four non enzymatic browning reactions were produced using the following conditions :

Table 1

	Flavour HCl-34/1	Flavour HCl-34/2	Flavour HCl-33/2	Flavour HCl-35/1
Initial amino acid composition	Standard hydrolysis HCl (6N)			
pH of reaction	7.0	7.0	7.0	7.0
Neutralizing agent	NH <sub>4</sub> OH	NH <sub>4</sub> OH	NH <sub>4</sub> OH	NH <sub>4</sub> OH
Sugar	Glucose	Glucose	Glucose	Glucose
Percentage of reaction (%)	55	55	55	55
Temperature of reaction (°C)	90	110	130	140
Time of reaction (hr)	140	72	72	72

P. Ghiste

PROJECT TITLE : SALAMANDER II  
PERIOD COVERED : NOVEMBER 1980 - JANUARY 1981  
WRITTEN BY : M. MURRAY

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The objective of project Salamander II is to develop zero ISH cigarettes of commercial quality. To this end the smoke components and their precursors in the filler responsible for cysteine reactivity should be identified.

#### Bibliography

Monthly reports from 1972 to 1980 concerning the project Salamander have been reviewed. A literature search has been made on Aquarius Stairs concerning ISH measurements and the reaction of cysteine with smoke components. At our request Inbifo have checked published literature on this topic via the data base Medlars.

#### Experimental

Familiarization with the ISH test has taken place at Cortaillod during December 1980 and January 1981. Some preliminary TLC separations of ISH trap solutions have been made and a number of possible reaction products or intermediates purchased.

#### Equipment

A Battelle type smoking machine has been equipped with a pump, this should now be calibrated. Cambridge filter holders have been ordered from FTR Serrières workshops and ventilated smoking machine hoods are being constructed by Plastiglas, Valangin.

Offers for more sophisticated HPLC and HPTLC equipment, needed for quantitative analysis of ISH trap solution components, have been requested.

#### Future Plans

It is intended to study the reaction products formed between smoke constituents and cysteine under the conditions for the ISH test. HPLC using coupled electrochemical and uv detectors, together with HPTLC techniques, will be used to separate and measure reaction products.

PROJECT TITLE : Nitrate Reduction by Controlled Fermentation  
PERIOD COVERED : January 5th - 26th, 1981  
WRITTEN BY : C. Ruf

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1. TRIALS

The trial NINO 66 ran from January 20th to 22nd in the pilot plant. The objective of the trial was to generate a certain quantity of denitrated RL extract. The extraction of a European RL feedstock blend was carried out in the Rotocell extractor. The corresponding extract was then fermented, centrifuged and concentrated to 20% total solids. This extract will be re-concentrated in laboratory equipment to 48% total solids in case of need for sizing of hand sheets (Ref. 1 and 2).

2. STRIP DENITRATION

2.1. All the operations related to strip denitration will henceforth be reported under the project name LEAR. The term NINO will only be used for stem or RL denitration by controlled fermentation.

2.2. Some of the cigarettes made in Richmond with Burley strips denitrated in trial NINO 65 were given for analyses to our smoking laboratory. A reduction of NO in the smoke of approx. 50% in Marlboro and 90% in 100% Burley cigarettes was found (Ref. 3).

2.3. A meeting took place on January 26th to fix some directions for the future pilot plant trials (Ref. 4).

3. PILOT PLANT

See monthly report "Pilot Plant Operations" written by N. Lüthi, January 1981.

4. MISCELLANEOUS

On January 23rd, the undersigned visited Nova Werke AG, a company specialized in high pressure extraction (Ref. 5).

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5. REFERENCES

- Ref. 1 : "Essai NINO 66", N. Lüthi, January 20th, 1981  
Ref. 2 : "Essai NINO 66", J.-M. Chassot, January 20th, 1981  
Ref. 3 : Fumage test No. 258/2361, 259/2362, 261/2363, 9/2364  
du 16.1.1981  
Ref. 4 : "Minutes of meeting to discuss future denitration trials",  
January 26th, 1981, C. Ruf  
Ref. 5 : "Report on the visit of Nova Werke AG", February 2nd, 1981,  
C. Ruf.

PROCESS DEVELOPMENT



C. Ruf

CLR/sde  
February 4th, 1981

0000144642

PROJECT TITLE : Pilot Plant Operations  
PERIOD COVERED : January 1st - 26th, 1981  
WRITTEN BY : N. Lüthi

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## 1. EQUIPMENT

### 1.1. Dryer

The inlet conveyor of the dryer was overhauled by the FTR workshop and has been installed.

### 1.2. Rotocell Extractor

The ancillary equipment, such as flow meter, multi channel recorder, steam regulator, etc. was checked by the supplier and put into service.

Different problems were observed with the hinged bottom plates of the rotocell extractor.

Some small tobacco particles passed through the slits of the bottom plates and caused clogging in the valves of the extract piping system.

This problem could be solved by fitting the bottom plates with a steel web of reduced slit size.

The extraction of RL was not possible with the modified bottom plates. The openings of the 20 mesh steel web were quickly blocked with dust and scraps.

Therefore we have to determine the optimal mesh size for the extraction of each type of feedstock material.

Furthermore it was noticed that the bottom plates did not close properly.

This problem will be solved soon.

## 2. LABORATORY

A Brookfield instrument was purchased to determine the viscosity of different liquids and slurries.

## 3. PERSONNEL

The new operator started work on January 5th and has nearly finished his training programme.

*N. Lüthi*

N. Lüthi, PROCESS DEVELOPMENT

NIL/sde

February 5th, 1981

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PROJECT TITLE : Unit Operations II  
PERIOD COVERED : December 1st, 1980 - January 26th, 1981  
WRITTEN BY : N. Lüthi

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#### EXTRACTION OF STRIPS

The first trials with the rotocell extractor were carried out at different feedwater temperatures (Ref. 1).

The objective was to determine possible differences between the new equipment and the carousel extractor, rented and evaluated last year (Ref. 2).

In both cases the feedstock was the same Burley strip blend with the following nitrate nitrogen and ammonia nitrogen levels :

$\text{NO}_3\text{-N} = 0.55\%$

$\text{NH}_3\text{-N} = 0.41\%$

Temperatures from 14 to 90°C were tried and the following conditions were kept constant :

Extraction time : 40 min.

Input strips : 12 kg/h

Ratio strips to water: 1 : 10

The effect of the feedwater temperature on different extraction grades are shown on Appendix 1.

In general the trials showed similar results as received last year, however two differences can be noticed :

- 1) The extraction grade for ammonia nitrogen at low temperature is 60% with the new equipment versus only 50% with the carousel extractor.
- 2) The concentration of ammonia nitrogen of the extract exceeds the level of nitrate nitrogen at all temperatures. The results obtained last year showed that the ammonia level started to exceed the nitrate level at 50°C. Ammonia seems to be more easily extractable.

#### DEWATERING OF STRIPS

The objective of the dewatering is the moisture reduction of the extracted strips by mechanical means.

Different equipment was tried (Ref. 3) and the following water reductions were found :



Water reduction  
(%)

Miele Spin dryer	51
Fruit press	32
Make shift roller	28
Stem roller	13

The spin dryer and the fruit press work batch-wise.

Because of our goal to realize a continuous dewatering system, we will try to optimize the make shift roller.

APPLICATION OF THE EXTRACT ON THE STRIPS

For the moment we have tried two different systems of extract application.

One is to spray the denitrated extract on the extracted strips.

The other is to plunge the strips into the extract.

We will follow up both possibilities and finally choose the more suitable one for a continuous application.

DRYING OF THE STRIPS

Two different suppliers of drying equipment were contacted. For the time being none of them could offer a convenient system. Therefore different make shift arrangements were tried using gas heated air. We are now able to dry small quantities of strips batch-wise.

REFERENCES

- Ref. 1 : Rapport d'essais 101-116, J. Broisy } File rotocell  
Analyses d'essais 101-116, J.-M. Chassot } extractor
- Ref. 2 : Monthly report, June 1980, Unit Operations II,  
N. Lüthi
- Ref. 3 : Notebook No. 2, R. Perrinjaquet, pages 11 + 12.

PROCESS DEVELOPMENT

*N. Lüthi*

N. Lüthi

NIL/sde  
February 5th, 1981

Effect of feedwater temperature on extraction grades of strips and on  $\text{NH}_3\text{-N}$  and  $\text{NO}_3\text{-N}$  concentration of the extract

Feedwater- temperature ( $^{\circ}\text{C}$ )	Extraction grades (%)			Concentration of the extract (g/l)	
	$\text{NO}_3\text{-N}$	$\text{NH}_3\text{-N}$	HWS	$\text{NO}_3\text{-N}$	$\text{NH}_3\text{-N}$
14	77	61	33	0.30	0.45
20	78	62	34	0.36	0.43
30	83	63	44	0.37	0.45
40	80	54	38	0.34	0.48
50	88	84	49	0.42	0.57
60	82	74	49	0.50	0.51
70	95	81	71	0.70	0.82
80	96	87	67	0.64	0.99
90	98	96	65	0.68	0.96

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PROJECT TITLE : RECONSTITUTED TOBACCO  
PERIOD COVERED : December 25th - January 28th, 1981  
WRITTEN BY : P. Karbacher

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#### MONIQUE/RCB

##### Quadrabeam moisture meter

This instrument consists of two main elements, the sensor and the moisture indicator with digital display. Up to now, the sensor had to be moved by hand from one position of the sheet to another. The operator had to choose at which point he wanted the moisture to be measured. In general the detector was left at the point of minimum moisture. Low and high moisture limits were set and an alarm was indicating if the sheet moisture passed these limits. Mid-January a system was installed to move the sensor continuously from one side of the sheet to the other. The drive of this unit is pneumatic and was built in the FTR Onnens workshop. The moisture indicator will soon be connected with a chart recorder.

##### Insulation of the Sandvik dryer

Two suppliers were asked to submit proposals for more efficient insulation of the dryer.

##### Monique/RCB trials

A trial blend containing an increased percentage of Monique/RCB sheet was prepared (Ref. 1). The cigarettes were submitted for analyses and subjectives and were accepted by smoke panel B (Ref. 2).

##### Organization

A new organization was set up in Onnens on January 1st, 1981. A meeting was held on January 22nd to define the status of the project. All financial files were transferred to the FTR engineering department. Mr. G. Montandon is responsible for finalizing the project together with F. Boichat, head of primary operations in Onnens (Ref. 3).


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The programme to improve the properties of the product will continue to be handled jointly by PME leaf department, progress development and production.

REFERENCES

- Ref. 1 : Commande d'échantillon, HWS, du 23.1.1981.  
Ref. 2 : Test de dégustation, HBO, du 27.1.1981.  
Ref. 3 : Monique - Reprise du projet par la division technique,  
P-V du 23.1.1981, G. Montandon.

PROCESS DEVELOPMENT



P. Karbacher

KPA/sde  
February 5th, 1981

PROJECT TITLE : CIGARETTE DEVELOPMENT - TECHNICAL REPORT  
WRITTEN BY : Z. SINGER  
PERIOD COVERED : January 5th - 27th 1981

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FINLAND

303. COUNTRY

Objective

To develop a diluted version of the MARLBORO Finland in order to reduce the CO delivery in the mainstream smoke.

Description of samples and results

A diluted MLF, prototype COU 303, was produced by ATO. The blend and filtering materials are the same as those of the undiluted existing MLF Finland. In order to be able to carry out dilution, the combination of Z3/60 electro-perforated tipping paper from Benkert with FU-POV 40 L porous plug wrap was used.

In order to maintain the same impact of the first puffs, the less porous Tercig 08,5 ND 4321 cigarette paper had to be used.

Comments on the results obtained and problems encountered :

- The cigarette tobacco weight is not within the specifications (standard specification : 793 mg). It is 68 mg out (- 9 %).
- In spite of the lower tobacco weight, an improvement in the firmness of the cigarette was observed (very curious).
- The prototype was tested against current MLF Finland. For the control sample it was not possible to find out the production date.

In view of these facts, it was suggested to repeat the trial following the standard specified weight and, at the same time, to produce the undiluted (current) version.

R & D PROJECT402 PITCH 3Objective

TAR : 3 mg/cig.  
SN : 0.3 mg/cig.  
Format : 7.95 / 25 / 84.4  
Taste direction : GAMMA

Summary

Following the PMS specifications the target TAR/SN values could be achieved :

- by using filtering materials of higher retention capacity.
- by increasing the dilution.
- by a combination of the above.

A cigarette paper of higher porosity than the existing Ecusta 708 (porosity 68 ml/cm<sup>2</sup>/min) could have a somewhat negative influence on the quality of the first puffs.

Description of samples and results

Based on the PMS blend (27 % of ET) trials were carried out with different filter and tipping papers and standard Ecusta 708 cigarette paper.

Three prototypes came within the objective :

Prototype No	3 P	8 P	9 P
Tipping paper	6xM 0.15.4.5	4xM 0.3.3.5	2xM 3.0.0.0
Filter	US 2.0Y/48000	2.5Y/55000	2.5Y/48000
Dilution	65 (3.01)	61 (2.39)	64 (6.52)
Total RTD	88	98	75
Filter RTD	124	129	93
DPM	3.2 (0.47)	3.4 (0.18)	3.5 (0.42)
TAR	2.9	3.1	3.2
SN	0.30	0.31	0.32
CO	4.1	4.4	4.4
NO	0.08	0.08	0.08
Puff count	7.8	8.2	8.5

In view of the standard deviations of individual measurements obtained (values in parentheses), only the trial run of prototype 8 P could be taken into consideration for further taste evaluation.

These prototypes will in any case be repeated with freshly flavoured PMS blend.

Observation : In the combination 6 x M. 0.15 . 4.5 micro-laser perforated tipping paper / FU-POV 100 plug wrap, the tipping paper is the limiting factor, no increase in dilution is obtained with plug wrap of greater porosity.

*Z. Singer*  
Z. Singer

01/29/1981/ZDS/cap

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PROJECT TITLE : CIGARETTE DEVELOPMENT - TECHNICAL REPORT  
 WRITTEN BY : A. FRATTOLILLO  
 PERIOD COVERED : January 5th - 27th 1981

UNITED KINGDOM

290 HILTON

Objective

To examine the influence of a different length tipping paper on cigarette smoke analytical values.

Description of samples and results

Trials were conducted with the intent of reproducing the same analytical values as those obtained in the previous cigarette prototypes Nos 74 C, 83 P and 85 P. To this purpose, three cigarette prototypes were produced, i.e. Nos 88 P, 89 P and 90 P. In these cigarettes, tipping paper of 29 mm instead of 32 mm was used while all the other parameters were left unchanged. The results of the above trials are shown in the table below. The numbers in parentheses indicate the code of the previous prototypes and related values.

Blend No	GB 1029001N02 -----			
Batch No	904 -----			
Prototype No	88 P (74 C)	89 P (83 P)	90 P (85 P)	
Total weight	985	1010	1015	(%Δ ±)
TAR UK	9.1 (8.9)	8.6 (8.7)	9.8 (9.3)	+ 5.4
SN	1.06 (1.19)	1.04 (1.12)	1.01 (0.95)	+ 6.3
CO	8.3 (8.3)	7.7 (8.2)	15.1 (13.9)	+ 8.6
NO	0.03 (0.03)	0.03 (0.03)	0.04 (0.05)	- 20
Puff count	9.0 (8.7)	9.2 (8.8)	8.0 (7.7)	+ 3.9



Comments

The results showed that small changes in length of the tipping paper could slightly effect some of the smoke analytical values. Indeed, while prototypes Nos 88 P and 89 P showed variations within the acceptability limits, prototype No 90 P showed considerable changes as can be seen in the last column of the table of results (%Δ ±). To avoid such changes, prototype No 90 P will be produced again with tipping and cigarette papers of higher porosity.

369 BEAUMONT

Objective

To determine the variation limits in the cigarette smoke analytical values. These variations are due to the fact that tobacco batches are laid down at different times.

Description of samples and results

For this test a total of four prototypes was considered, i.e. prototypes Nos 11 C1, 12 C1 and 12 C1, 12 C2 which were produced with the same type of tobacco blend. Moreover, the cigarette design remained unchanged in both series : C1 and C2.

This test considered in particular the laying-down time of tobacco batches as being the factor which could influence the smoke analytical values. Therefore, two series of cigarette prototypes were produced as is shown in the following :

Prototypes Nos 11 C1 + 12 C1 : with tobacco blend No GB 0236905N02 of batch No 934, laid-down November 1980.


Prototypes Nos 11 C2 + 12 C2 : with tobacco blend No GB 0236905N02 of batch No 950, laid-down January 1981.

The analytical values obtained in the above trials are shown in the table of results hereafter :

Blend No	GB 0236905N02 -----			
Batch No	934	950	934	950
Laid-down date	Nov. 1980	Jan. 1981	Nov. 1980	Jan. 1981
Prototype No	11 C1	11 C2	12 C1	12 C2
Total weight	923	923	918	928
Dilution (%)	59	59	47	48
TAR UK	3.5	3.3	4.4	4.5
SN	0.37	0.33	0.39	0.50
CO	5.2	4.9	6.3	6.8
NO	0.10	0.10	0.13	0.12
Puff count	8.0	7.9	7.7	8.0

Comments

When considering the differences in the percentage of dilution between the two series of prototypes, i.e. 11 C1 versus 12 C1 and 11 C2 versus 12 C2, it can be concluded that, in this specific test, the laying-down-time of tobacco batches does not significantly influence the final results.

  
A. Frattolillo

01/29/1981/ANF/cap

0000144654

PROJECT TITLE : CIGARETTE DEVELOPMENT - TECHNICAL REPORT  
WRITTEN BY : P. NAGEL  
PERIOD COVERED : January 5th - 27th 1981

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SWITZERLAND

374 MONTANA

Objective

To develop an ultra low tar cigarette with the following characteristics :

TAR : 0.1 mg/cig.  
SN : 0.01 mg/cig.  
CO : 1.0 mg/cig.  
NO : 0.01 mg/cig.  
Puff count : > 6  
Format : 7.95 / 25 / 79.4  
Taste direction : Air-cured

Summary

(Please see monthly report of October-November 1980).

The aim of the preliminary study, the results of which have been discussed with the Swiss Marketing Department, was firstly to confirm our theoretical concept, without however extracting a final product.

Only prototype No 4 P appears to be worthy of further development due to the following reasons :

- The air-cured direction was definitively accepted.
- The ratio SN/TAR of this prototype is the closest to the goal ratio 0.1.
- The puff count corresponds to the objective.
- The use of a high porosity cigarette paper for such a highly diluted cigarette does not appear justified.

Description of samples and results

Three prototypes, Nos 6 P, 7 P and 8 P, with the same specifications of prototype 4 P, except for the tipping paper, were produced.

Prototype No	4 P	6 P	7 P	8 P
Tipping paper macro-laser perforated	3xM.3.0.0.0	4xM.2.0.1.1	5xM.2.0.1.1	4xM.3.0.0.0

Prototype 6 P : The analytical figures are not within the objective.

Prototypes 7 P and 8 P : The analytical figures are within the objective. Moreover, only prototype 8 P was submitted to the Swiss Marketing Department because of the cheaper tipping paper used and also because some technical problems may be encountered during the gluing of 5-row of macro-laser perforated tipping paper with the standard skip-tip glue applicator.

Prototype No	4 P	8 P
Blend	FLL -----	
Cigarette paper	WP 60 -----	
Tipping paper	3 x M. 3.0.0.0	4 x M. 3.0.0.0
Filter	2.1 Y / 48'000 -----	
Dilution (%)	85	90
Total RTD (mm WG)	79	69
Filter RTD (mm WG)	133	135
TAR	0.2	0.06
SN	0.04	0.01*
CO	0.5	0.3
NO	0.01	0.05
Puff count	6.7	7.0

\* : Outside the threshold detection of our methods.

It must be pointed out that this cigarette, which fulfils the objective, is, at the same time, easy to light and draw. Moreover, even an insensitive smoker will detect a slight air-cured taste.

Follow-up

A mentholated version of prototype 8 P will be produced.

399 TEXASObjective

To develop an ultra low tar cigarette of the air-cured type with the following characteristics :

TAR : 3.0 mg/cig.  
 SN : 0.3 mg/cig.  
 CO  $\leq$  5.0 mg/cig.  
 NO  $\leq$  0.1 mg/cig.  
 Puff count : 7  
 Format : 7.95 / 25 / 79.4

Summary

The expert panel A found the special spicy tobacco taste of prototype 8 P interesting, whereas Marketing Department did not. Therefore, to clarify the situation, it was suggested to lay down a new tobacco blend and to add humectants in this and in existing FLL blends.

Description of samples and results

(Please see monthly reports of October-November and November-December 1980).

Two prototypes with the specifications of the prototype 8 P were produced using two different blends. The humectants (propylene glycole 1 %, glycerin 1 %) were added to.

Prototype No	10 P	12 P
Blend	FLL	CH 1239901N02
Cigarette paper	BDP 30	-----
Tipping paper	6 x M. 0.3.3.5	-----
Filter : Plug 1	5.0 I / 46'000	-----
Plug 2	5.0 X / 40'000	(with N.A. charcoal)
Plug 3	2.5 Y / 48'000	
Tobacco weight mg/cig.	530	527
Filter RTD mm WG	78	77
Total RTD mm WG	67	67
Dilution %	62	63
TAR mg/cig.	3.1	2.9
SN mg/cig.	0.31	0.25
CO mg/cig.	4.1	3.8
NO mg/cig.	0.06	0.06
Puff count	7.0	7.0

Both prototypes are within the objective.  
As regards the organoleptic qualities, two prototypes show a considerable improvement when compared with prototype 8 P and have been accepted by Marketing Department for the foreseen product test.

*P. Nagel*

P. Nagel

01/29/1981/PHN/cap

0000144658

PROJECT TITLE : PRODUCT DEVELOPMENT LABORATORY )  
WRITTEN BY : S. BEGUIN  
PERIOD COVERED : December 12th 1980 - January 27th 1981

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1. CIGARETTES PRODUCED IN THE MANUFACTURING DEPARTMENT

a) Total quantity : 1,068,000  
b) Number of prototypes : 93

2. TOBACCO BLEND TRIALS IN THE PRIMARY DEPARTMENT

a) 14 x 1,000 kg (unflavoured)

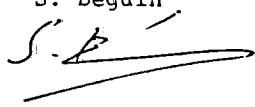
3. FILTER RODS PRODUCED IN THE FILTER MAKING DEPARTMENT

a) Total quantity : 280,000  
b) Number of prototypes : 8

4. PACKS (20 cig.) PRODUCED IN THE PACKING DEPARTMENT

a) Total quantity : 22,200  
b) Number of projects : 12

5. PRODUCT TESTS PREPARED : 3

S. Béguin  


SEB/cap

0000144659

PROJECT TITLE : ADDITIVE AND FLAVOUR DEVELOPMENT  
WRITTEN BY : J.-P. FATTON  
PERIOD COVERED : October 25th, 1980 - January 25th, 1981

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S W I T Z E R L A N D

266 / 271 HARVARD / COLORADO

Objective

Development and application of different aftercut solutions for Muratti type brands.

Summary

Five flavours were developed in Neuchatel and two flavours received from Richmond. They were applied on several tobacco batches, cigarettes were made and submitted to panel A.

Description

In a first step. EAC 9,10 and 16 developed in Neuchatel and EAC 41 and 42 from Richmond were applied on both Harvard and Colorado. None of these flavours were retained, as they did not give a better taste than the non flavoured tobacco.

In a second step. EAC 52 and 53 were developed for Harvard. EAC 52 was choosen by the experts as the best one.

Colorado prototypes are still under evaluation but until now the non flavoured version is preferred by panel A.



399 TEXAS

Objective

Improvement of the taste by addition of a precutting solution.

Summary

On undesirable dark and spicy taste was detected during smoking Texas prototypes by Panel A. It was proposed to make the taste cleaner and more open by application of a precutting solution containing humectants.

Description

The Texas blend was sprayed with EPC 5 at a flow rate of 151 l / 1000 Kg total blend and cigarettes were made.

Comments

After smoking it was decreed that the prototypes were up to expectation.

384 ICEBERG

Objective

To develop a 1 mg tar mentholated cigarette.

Summary

Two solutions have been made containing less menthol than the usual solutions. These solutions have been sprayed on two different aluminium bobines. Cigarettes were packed with this mentholated aluminium foil and stored for 1 month.

Description

Two prototypes were produced : the first packed with the aluminium foil sprayed with EFM 1 containing 100 % natural menthol, the second packed with the aluminium foil sprayed with EFM 2 100 % synthetic menthol. These cigarettes were smoked and the first impression was that the menthol level was far too low.

Follow up

Taking into consideration the results of this first trial new recipes were established in order to increase the menthol level and to improve the taste quality.

GERMANY

335 LOLITA

Objective

Development and application of new flavouring ingredients to improve the taste of the existing brand.

Summary

The different ingredients developed in Richmond and the ones developed in Neuchatel have been evaluated and some of them have been retained.

Description

The best version used EBC 2 developed in Richmond as Burley casing, and EPC 2 developed in Richmond as precutting solution. The aftercutting solutions in competition are EAC 31 and EAC 38.

Follow up

Fine adjustments still have to be realised in order to decrease the flavour impact which dominates too much the tobacco taste.

PROJECT TITLE : TOBACCO ANALYSIS

WRITTEN BY : L. JOSEPH

PERIOD COVERED : December 1st, 1980 - January 27th, 1981

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1. TOBACCO LOT ANALYSES

SPECIAL TRIALS

MD + tobacco, storage influence (Ref. 1)

Objective

This trial was made in order to determine if the influence of the storage in USA is as same as in Europa (Onnens). The examination of the tobacco is made on organoleptic and chemical characteristics.

Summary

Two different grades of US MD tobacco have been tested. Of each grade ten samples were taken in Onnens and ten samples in USA at the beginning of the storage (1979). A similar sample was made after one year of storage.

Overview

Part of the forty samples of the second series have been analysed. The results will be evaluated as soon as the last samples are analysed.

LTR - NEW BLEND RECIPE

Objective

A trial was made in Le Mans with a new recipe in order to increase the dust proportion in their blend (from 20-30 % to 50-60 % dust).

Comments

Compared to the standard LTR, we have :

- a higher N-NO<sub>3</sub> level (0.32 % instead of 0.15 to 0.25 %) and a higher NO delivery (0.35 mg/cig instead of 0.15 to 0.25 mg/cig).
- a slightly lower DPM delivery (8.2 instead of 9.1 to 9.6 mg/cig).
- a higher TA level (0.92 % instead of 0.4 to 0.7 %). This last analysis must be confirmed because the smoke nicotine does not show any significant difference compared to the standard. The rest of the analysed parameters show no significant differences.

ROUTINE TOBACCO LOT ANALYSES

Introduction of inputs on EDP

Partial analytical results of ten lots were introduced in the PME Analytical Data List.

Lots under evaluation

Eight lots are under evaluation

Lots available, but not yet analysed

None.

2. ASSISTANCE TO OTHER PROJECTS

NINO

Objective

Denitratation of strips by fermentation in order to decrease the NO delivery of the cigarettes.

### Overview

We have received two samples of a blend of Burley strips, one denitrated by the Nino process, the other untreated. TLA analyses were made on the two samples. Due to the small amount of tobacco of the standard, cigarettes had to be handmade.

### Comments

Compared to the standard, the denitrated sample shows :

- lower TA level (1.73 % instead of 2.53 %)
- lower N-NO<sub>3</sub> level (0.03 % instead of 0.55 %).  
The reduction is about 95 %.
- lower NO delivery (0.04 mg/cig instead of 0.60 mg/cig).  
Reduction of about 93 %.
- lower N-NH<sub>3</sub> level (0.05 % instead of 0.44 %)
- higher CO delivery (20.0 mg/cig instead of 14.1 mg/cig)  
The increase is about 42 %.
- lower puff count (8.3 instead of 9.1)
- lower HCN delivery (148 µg/cig instead of 178 µg/cig)
- lower ISH index (36 % instead of 56 %)

### SPOTLESS, SPECIAL TRIALS

#### Objective

Study the influence of the addition of potassium nitrate instead of tripotassium citrate on the washed "B" blend.

#### Comments

The potassium nitrate does not influence the CO and the DPM delivery, but the other smoke parameters show some great variations. We observe for the sprayed potassium nitrate sample :

- higher filter efficiency (based on the smoke nicotine analyses : 67 % instead of 52 %)
- lower puff count (5.4 instead of 6.4)
- higher aldehydes delivery (1.77 mg/cig instead of 1.40 mg/cig)
- higher N-NO<sub>3</sub> level (1.18 % instead of 0.00 %)
- of course higher NO delivery (1.30 mg/cig instead of 0.03 mg/cig)
- very high HCN delivery (210 mg/cig instead of 91 mg/cig, the increase is about 131 %).

We notice also that only about 20 % of the potassium extracted was bound with NO<sub>3</sub>, the other 80 % comes from the extraction of other inorganic or organic salts.

Due to the low amount of TA, it will be necessary to repeat the filter efficiency analyses in order to confirm these influences.

#### ETON

The analytical results of the FC blend expanded in Onnens compared to the FC blend expanded in USA show :

- lower TA level (1.47 % instead of 2.26 %)
- higher RS level (17.5 % instead of 6.4 %)
- lower N-NO<sub>3</sub> level (0.02 % instead of 0.11 %)
- lower NO delivery (0.00 mg/cig instead of 0.11 mg/cig)
- lower SN delivery (0.63 mg/cig instead of 0.88 mg/cig)
- higher puff count (7.3 instead of 6.6)
- lower HCN delivery (160 µg/cig instead of 207 µg/cig)

The other analysed parameters do not show any significant difference.

0000144667

Reference

1. Mr. Karle's report : "Chemical, physical and organoleptic examination of MD tobaccos ....., of May 12, 1978", dated September 19th, 1978.

0000144668



PROJECT TITLE : ETNA Evaluation  
WRITTEN BY : B. Krasna  
PERIOD COVERED : December 1980 - January 1981

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#### Production summary

By January 26th, 1981 the following quantities of ETNA had been produced :

- ET-FC : ~ 64000 kg  
- ET-CH : ~ 8000 kg

Stock situation of expanded tobaccos :

- ET-FC : 60000 kg  
- ET-CH : 4600 kg  
- DBC-Bright : ~ 1700 kg  
- Corean tobacco : 650 kg  
  
- FC ex USA : 10700 kg  
- BUR ex USA : 7000 kg

There still are some problems to process the Swiss tobacco : it seems to be more fibrous. A reduction of the moisture content of the incoming cut tobacco seems to help (from 22 % to 19 %), as well as an increase of the soak time in the impregnator.

#### Cigarettes

The following cigarettes will be made with expanded tobacco ex USA until it is used up, and then the cigarettes will be switched to tobacco expanded in Onnens :

- MLZ : 13 % FC  
- FLI : 7 % FC  
- California : 18 % FC  
- BEP : 27 % BUR

The following brands are already using expanded tobacco ex Onnens :

- BRT : 27 % ET-CH
- FLL : 27 % ET-CH
- MLF : 2.2 % ET-FC

Expanded tobacco ex Onnens will be used in the following brands as soon as they are processed :

- MER : 3.0 % ET-FC
- PMM : 2.2 % ET-FC
- PMK : 2.2 % ET-FC
- BRF : ET-CH } awaiting final
- NPF : ET-CH } blend receipe

A new evaluation is being carried out on FLL, FLI, MLZ, BRT and California cigarettes. Results should be evaluated shortly.

#### Miscellaneous

Tobacco Lot Analysis will be carried out on each lot of finished product (once a month) as well as on any blend modification.

Add-back system : following the modifications carried out in December, the maximum amount of expanded tobacco that can be added to the blends is now 30 %. The minimum amount is 2.5 %. A distribution curve of the effective amount of ETNA in MLF will be made and presented to the blenders, in the hope that they will raise the brands with 2.2 % to 3 % ETNA.

*B. Krasna*  
B. Krasna

January 26th, 1981 BEK/sc

PROJECT TITLE : Cigarette and Smoke Analysis  
Period Covered : January 5 - 30, 1981  
Report Written by : F. Senehi

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#### SMOKING MACHINE

- The new smoking machine Filtrona 302 (8 ports) received by QC PME in December 1980 is not yet operational due to some problems in the electronic circuit.
- The two Borgwaldt RM 20CS smoking machines have been connected to a computer Hewlett-Packard HP 9825. This system, which will be operational at the beginning of February 1981, will permit us to analyse simultaneously and puff by puff the carbon monoxide and the nitrogen monoxide in the smoke in both machines.

#### PRODUCT REPORTS

Product Reports were written on the following new or modified brands:

<u>Brand</u>	<u>Manufacturer</u>	<u>Country of sale</u>
Dunhill Int. 94 (50 cigarettes in a garnet-red plastic box)	Carreras-Rothmans	France
News (new brand, full flavor cigarette)	Seita	France
Peter Stuyvesant Extra Mild Luxury Length 94/F (line extension)	Turmac Int. (Rothmans)	France
Peter Stuyvesant Ultra Mild 84/F (new brand)	Turmac Int. (Rothmans)	France
M 120 (re-designed pack)	Reynolds	West Germany
M 120 Menthol (re-designed pack)	Reynolds	West Germany
Perkins 94/F (new brand)	BAT	West Germany
Reemtsma No. 1 Menthol Leicht 84/F (line-extension to Reemtsma No. 1)	Reemtsma	West Germany
Roxy Dual 84/F (imported from Netherlands)	Niemeyer	West Germany
Tareyton Long Lights 100/F (imported from USA)	American Tobacco	West Germany

PROJECT TITLE : Cigarette and Smoke Analysis

Brand	Manufacturer	Country of sale
Benson & Hedges Special Mild 84/F (line extension)	Suomen Tupakka	Norway
Petterøe's King Size Mild 84/F	Tiedemanns	Norway
Blend Ultra Menthol 80/F (line extension)	Swedish Tobacco	Sweden
MaryLong Double Filtre 79/F (new brand)	BAT	Switzerland
Peer Special soft 80/F (replaces the former Peer Special box)	Laurens	Switzerland
Winston King Size 84/F (re- designed pack, new type of filter)	Gallaher	United Kingdom

SMOKING PANEL

The following version was mail-out tested:

Brand: Marlboro

P 87 = Standard (Batch MLF 515)

B 43 = Trial/1,7 % RCB USA replaced by RCB Monique/a,  
lot No. 135 (Batch MLF 938)

According to the statistical evaluation, no difference was found.

QC FINISHED PRODUCTS

*F. Senehi*  
F. Senehi

04.02.81  
SEF/edk

0000144672

PROJECT TITLE : Additives and Analytical Services  
Period Covered : December 23, 1980 - January 22, 1981  
Report Written by : A. Widmer

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#### TRIALS WITH NEW SUPPLIES OF TOBACCO ADDITIVES

- Ground Cocoa shells (ex MAC ANDREWS & FORBES, Camden (U.S.)/  
1 kg) - Ref. 1

The sample corresponds to our specifications.  
As at the present time FTR production adequately covers all  
our requirements, no further action is planned for the moment.

- Raw cane sugar (ex FIDSCHI, AUGUST TÖPFER & CO., Hamburg/  
500 g) - Ref. 1

The sample corresponds to our specifications.  
However, the production source must be assured before an  
industrial trial may be planned.

#### QUALITY CONTROL OF TOBACCO ADDITIVES

- Dry Flavour (ex PMI, New York; PMG, Berlin) - Ref. 2

An organoleptic test confirmed that three drums out of 150  
of the last shipment did not contain "Dry Flavour C". The  
contents of the three drums will be destroyed on PMG premises.

QC Analytical Services

  
A. Widmer

#### REFERENCES:

1. Letter from A. Widmer to Mr. R. Froidevaux, dd 13.01.81
2. Letter from Mr. W. Tessendorf to A. Widmer, dd 17.12.80  
Letter from A. Widmer to Mr. W. Tessendorf, dd 22.01.81

28.01.81  
ALW/edk

0000144673

PRODUCT TITLE : NEW MATERIAL DEVELOPMENT

WRITTEN BY : E. ERKOHEN

PERIOD COVERED : November 28th, 1980 - January 27th, 1981

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## 1. TIPPING PAPER

### 1.1. Malaucène micro-laser perforated tipping papers "3M 0,11.6.5 and 2M 0,17"

#### Objective

Possible replacement of the existing tipping paper on MLF-CH and MLK-CH brands with micro-laser type tipping paper.

#### Summary

MLF-CH and MLK-CH cigarettes are produced with electroperforated tipping paper Benkert Z3/60. The perforation of the tipping paper is more visible now, due to deterioration of Benkerts' quality. Trials have been carried out with micro-laser perforated tipping papers to attain the same smoke deliveries as obtained by using Z3/60. Unfortunately the late evaluations done on these trials were not conclusive.

The permeability of air of these micro-laser perforated tipping papers mentioned above are 59 l/h/4 cm. MLK-CH cigarettes were made with these qualities and compared to cigarettes made with Benkert Z3/60 (permeability of air : 59 l/h/4 cm). The results on dilution and smoke analyses have not been received yet. As soon as results are available the cigarettes will be submitted to taste evaluation for a final decision, concerning the use of micro-laser perforated tipping on MLK-CH and MLF-CH cigarettes.

### 1.2. Ecusta micro-mechanically perforated tipping paper

#### Objective

Possible replacement of the existing tipping paper on MLF-CH and MLK-CH with micro-mechanically perforated tipping paper.

Summary

Ecusta submitted (1) micro-mechanically perforated tipping paper. The first trial run on MLK-CH to substitute the existing tipping paper Z3/60 was negatif : the dilution reached was low compared to the standard. We asked Ecusta to increase the permeability of air of the tipping paper. We recently received a sample of micro-mechanically perforated tipping paper at 60 l/h/4 cm.

Trial runs on MLK-CH cigarettes were done with this tipping paper and compared to cigarettes made with Benkert Z3/60. We have not yet received the dilution and smoke delivery results.

1.3. Benkert EPZ Z3/60 alternative quality Z3/60 0175

Objective

Possible replacement of the existing tipping paper on MLF-CH with an alternative quality of EPZ proposed by Benkert.

Summary

Benkert was contacted for the deterioration of their current quality (holes visible). Benkert proposed an alternative quality of tipping paper where the holes made by electro-perforation were less visible due to a quality change of the base paper. A trial has been done on MLF-CH cigarettes and was compared to their current quality (2).

The smoke results and dilution obtained by using the alternative quality of Benkert were comparable to the standard quality. Although a slight increase of puff count was noticed (7 %) the analytical smoke results were at the same level. We do not think that this increase of puff count is significant. The cigarettes were submitted to taste evaluation : the cigarettes were found different because during the first puffs the trial cigarettes "picked the nose" (3).

## 2. FILTER PAPER

### 2.1 Schöller and Hoesch Fu POV 40 mg1 and 150 mg1

#### Objective

Weight saving and increase of autonomy of the bobbins on the filter rod maker.

#### Summary

Schöller and Hoesch developed new porous plug wraps with a substance of 20 g/m<sup>2</sup> which have properties comparable to their usual grades with a substance of 30 g/m<sup>2</sup>. From a technical point of view there is an advantage of less down time of the bobbins on the filter rod maker: the 20 g/m<sup>2</sup> paper Fu POV 150 will be approximately 5000m long compared to only 3000m for the 30 g/m<sup>2</sup> quality, for a specified outside diameter of the bobbin of 580mm. The first trial runs were done with Fu POV 150 mg1 on FLLPC-100 filters for machinability tests, then FLL-CH cigarettes were made with these filters and compared to FLL-CH standard cigarettes. There was no significant difference noticed on smoke deliveries and dilution between trial and standard cigarettes (3). But tastewise the trial gave less impact.

On the variants of porous plug wrap proposed in the same series was the Fu POV 40 mg1. MLFPB-108 filters were made. An RTD of 355 mm WG was obtained on the filter rods (standard specification 375 mm WG). We presume that this deviation from the standard specification is because of the thickness of the paper. We noticed that the thickness of the quality submitted was 0.040 mm instead of the usual 0.073 mm. Since the RTD is a function of diameter, it is normal that a lower RTD was reached with the new filter paper submitted.

We are now going to produce MLF-CH cigarettes with these filters and compare them to MLF-CH standard cigarettes.

## 3. CIGARETTE PAPER WATTENS E-30179

#### Objective

Reduction of CO by using cigarette paper.



Summary

Wattenspapier sent us a sample bobbin which is semi-combustible and has a permeability of air of 62 coresta. According to the supplier this paper can influence the carbon monoxide delivery of a cigarette (4).

We produced MLK-CH cigarettes with this cigarette paper, but we have not yet received the smoke delivery results.

4. NEW FILTRATION MATERIAL4.1. Paper filtersObjective

Evaluation of paper filter efficiency.

We received three different types of paper filters from Intertaba. The physical characteristics of these filters are given in the table below.

Type	<u>Δ007</u>		<u>Gala</u>		<u>Normal</u>	
Length mm	108	100	108	100	108	100
RTD mm WG	254	247	202	193	257	246
St. deviation on RTD	18	-	6	-	14	-
Weight mg	906	833	898	818	862	788
Diameter mm	7.86	7.86	7.86	7.86	7.86	7.86

In order to determine if the filtration efficiency is proportional to filter tip length we produced standard cigarettes with filter tips of 10 mm, 18 mm and 25 mm. All these cigarettes will be smoked to a butt length of 33 mm.

4.2. Polyolefin fibersObjective

Evaluation of filtration efficiency of Polyolefin fibers.

Samples of polyolefin fibers were submitted by 3M Switzerland. Two types of polyolefin fiber have been evaluated for their filtration efficiency : type M which is pure polyolefin fiber and type C which is a mixture of polyester, polyolefin fiber (35 % polyester and 65 % polyolefin fiber by weight). Cambridge type pads were made with these fibers and compared to usual Cambridge pad filters for their efficiencies. For a given weight the C type is 10 % more efficient than the Cambridge pad and the M type is 57 % more efficient. We repeated the experiences twice and the results were in accordance. We went further and made hand made filters with these fibers and compared the efficiencies to cellulose acetate filters. For this purpose we used Merit-DB type cigarettes where we could take out the cellulose acetate filter and replace it with the fibers mentioned above. We respected the specification for the total RTD (147 mm WG encapsulated), using 80 mg of M type fibers, 100 mg of C type fibers respectively. Efficiencies determined on the basis of smoke nicotine are shown in the table below.

Type	C	M	Cellule Acetate 2.5 / 48.000 Y
Mean Total RTD cigarette mm WG	140	156	147
St.deviation on RTD	21	21	5
Weight of fiber "mg"	100 $\pm$ 5	80 $\pm$ 5	146
Smoke nicotine found on the filter "mg"	1.13	1.04	0.86
Smoke nicotine found on Cambridge "mg"	0.34	0.40	0.69
Efficiency % on the basis of smoke nicotine	77	72	55
Nb of puffs	6.8	6.9	6.9

On the basis of the results obtained we can assume that polyolefin fibers submitted are more efficient than the cellulose acetate fibers. Research work will continue on this subject. Our main objective now is to produce polyolefin filters on filter machines and to evaluate the filters obtained.

References :

1. Monthly report on New Material Development of July 1980.
2. Monthly report on New Material Development of November 1980.
3. Taste evaluation of December 3rd, 1980.
4. Letter of Watterspapier to E. Erkohen, October 14th, 1980.

PROJECT TITLE : SPECIFICATIONS / PROCESS ASSURANCE

Period Covered : 25.12.1980 - 27.1.1981

Report Written By : T. Bel - C. Flury - A.-M. Kopp

Report Approved By: J.B. Boder

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0. SPECIFICATIONS - OVERALL

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1. SPECIFICATIONS PER PRODUCTION CENTER PME

1.1 FTR Neuchâtel

- The cigarette making specifications for Marlboros and Merits have been modified to comply with the standard tobacco weights and AccuRay limits set forth for the three months' test (1.1. - 31.3.1981). (Reference 1)

1.2 INM SpA Zola Predosa

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1.3 PMH Bergen op Zoom/Eindhoven

- Cigarette making specs Marlboros as per FTR, point 1.1 above.

1.4 PMG Munich/Berlin

- Cigarette making specs Marlboros and Merits as per FTR, point 1.1 above.

1.5 WELTAB Bruxelles

- Cigarette making specs Marlboro and Merit as per FTR, point 1.1 above.
- A new product version of Merit, MER 059, for sale in Luxemburg, has been introduced.
- The tow weight of the 100 mm Merit filter has been increased, to meet the RTD increased last year.

1.6 PM UK London

1.7 PM Nigeria, Ilorin

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1.8 Licensees

- Poland:  
The complete spec file for Marlboro King Size, Poland, is being reviewed.

2. MATERIAL SPECIFICATIONS

2.1 Approvals by suppliers

The firm I.C.I., Zurich, has approved the material specs for their Propafilms C 23 and MTX 22.

2.2 Submissions to suppliers

PME material specs have been submitted for/to:

- |                                   |                    |
|-----------------------------------|--------------------|
| - Cig. paper TERCIG H 10 DIN 60   | Tervakosky         |
| - Cig. paper TERCIG O 8,5 ND 4321 | Tervakosky         |
| - Cig. paper Pela 200/09 Velin    | Schoeller & Hoesch |
| - Tipping paper Acquafuge 944 BNG | Malaucène          |

2.3 Special work

- A meeting was held in Neuchâtel to clarify and define the situation regarding the qualities, suppliers, and the usage of films (cellophanes and polypropylenes).
- The new cigarette paper TERCIG O 8,5 ND 4321 is accepted for MLL Marlboro Lights, produced with ATO Finland. - It is refused for MLF Marlboro Filter, manufactured at the same production center.

After confirmation by Panel A, it may be used in Eastern European countries, in the future.

3. PME STANDARD RECIPES

- The composition of solution BEM-PC (ATO Finland) has changed.
- Corrections regarding the usage of several solutions used by Ed. Laurens BV, The Hague, have been applied.

4. SPECIFICATIONS ON EDP

About 5 working days were spent on the above project, together with C. Cotting, EDP FTR, on the one hand,

and MM. M. Davis and D. Magil on the other hand. In a first phase, the business situation and functions of SOPA (Specs Office and Process Assurance) have been outlined.

Following the review session of January 21, 1981, detailed analysis and evaluation (functions, tools, information requirements, system concept) are being defined in cooperation with E. Grossen, QA manager FTR, as a representative for the production centers' QA managements.

Another review session with the PME EDP representatives is planned for end February, 1981

## 5. PROCESS ASSURANCE

### 5.1 AccuRay

Following the decision to carry out a 3 months' industrial trial with standard tobacco weights and AccuRay settings for Marlboro and Merit cigarettes, as from 1.1.1981, the situation is the following in the various production centers:

#### FTR

The new limits were introduced end December, 1980. No problems.

#### PMG Munich

No problems.

#### PMH

A first trial with the new limits was made on 5 machines.

Results:

- tobacco savings about 2 %
- compressibility about 4,0 mm
- compressibility on the other machines about 3,8 mm
- practically no problems regarding light weight rejects, loose ends, and rejects at the packers.

#### WELTAB

The new limits were introduced mid-January only. End January 1981, there still existed some problems regarding the calibration of the C 1700 units. - As a consequence, the results of January cannot be considered in the test evaluation.

5.2 NTM Non-tobacco Material Weights (Reference 2)

- A detailed report has been addressed to FTR Cousset regarding the trials to be realised.
- Determination of quantity of glue on tipping paper: We are still waiting for the Munich and Berlin results.

5.9 Tobacco Weights

All production centers have adapted their specifications (see also AccuRay), except PMH.

5.13 Production Diana, MTI Lecce IT

In December, 1980, taste problems turned up when a trial production was made, with a blend containing new blocs of tobacco. In the following, a PME delegation assisted at another trial production in Lecce, as well as at the start of production in January. The cigarettes were smoked and approved on site.

Samples of all supply materials, ingredients, and solutions, were brought back from Lecce for a complete quality check in the PME labs in Neuchâtel.

5.14 ETNA Specifications

A new provisional spec has been prepared for ETNA, flue-cured type. A unique spec will be produced in future, covering the sections

- processing of the tobacco
- process for expanded tobacco

Thierry Bel

Catherine Flury

Anne-Marie Kopp

References

1. Standard tobacco weight and AccuRay limits. Memo T. Bel to QA managers, 5.12.1980
2. Report to Mr R. Jaquet, FTR Cousset, regarding NTM trials, dated 6.1.1981.

PROJECT : LEGISLATION  
PERIOD COVERED : DECEMBER 1980 - JANUARY 1981  
WRITTEN BY : C. JEANNERET

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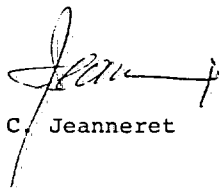
1. EEC

A draft resolution on tobacco consumption has been submitted to the European Parliament by an Italian. It concerns, in particular, measures that should be taken to oblige cigarette manufacturers to indicate the condensate and nicotine yield of their cigarettes on their packets and in their publicity.

2. ADDITIONAL TAX ON CIGARETTES WITH MORE THAN 20 mg CONDENSATE IN THE UK

A report has been published which contains indications on research work commissioned to several institutes. The report includes the results of various testing methods for determining the condensate and nicotine content of cigarette smoke. The results submitted to the commission show considerable divergences and the institutes are allegedly unable to account for them.

Later, in a report on the repercussions brought about by the tax increase, the commission came to the conclusion that the UK additional tax no longer served any useful purpose. Furthermore, the commission concluded that, should member states have the intention of reducing smoking for health reasons, they should raise the overall tax level.

  
C. Jeanneret



PROJECT TITLE : LEGISLATION / GERMANY  
PERIOD COVERED : JANUARY 1981  
WRITTEN BY : W. FINK

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#### PESTICIDES

The decree on "Anwendungsverbote und -beschränkungen für Pflanzenbehandlungsmittel (Pflanzenschutz-Anwendungsverordnung)" dated 19th December, 1980, was published and issued in BUNDESGESETZBLATT, 1980, part I (pages 2335-2341), dated 30th December, 1980.

The decree, paragraph 1, enclosure 1 regulates the application of ethylene oxide on tobacco.

#### POLYVINYL ACETATE

Special permission according to paragraph 37 LMBG for Production and Distribution of "Kunstharzdispersionsklebstoff" (PVA) as Cigarette Side Seam Adhesive (announcement by BMJFG of 1st July, 1980, - GMBT p. 414 -).

LW-Fuller GmbH, Lüneburg, has received approval to produce and distribute "Dispersionsklebstoff" which will be used as cigarette side seam adhesive. The quantity distributed yearly must not exceed 15 tons.

W. Fink

PROJECT TITLE : INSTRUMENTATION AND PROCESS  
AUTOMATION

PERIOD COVERED : JANUARY 1981

WRITTEN BY : M. THEVOZ

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The configuration described previously<sup>(1)</sup> is now being used to carry out a more extensive study. This survey covers different topics all concerning NO<sub>3</sub> electrode drift and response in standard solutions as well as in raw tobacco extracts. The microcomputer used in this survey for controlling the process was a HP 85 desk top and had a 16 K memory extension. It was also fitted with the following two interface cards :

- GPIO (General Purpose Input-Output)

This card senses different digital input signals and drives the different power lines which are connected to the pump and magnetic valves.

- BCD (Binary Coded Decimal)

This card provides a flexible means of communication between instruments offering parallel-digital outputs.

The main programme being tested at the present time is written in BASIC and uses the powerful I/O statements specially developed for this desk-top computer. Using the first version of the process control programme particularly designed for laboratory use, the following operations were able to be performed :

- A complete, automatic cycle of calibration and measurement of the ion-analyser;
- Selection of a pre-defined sampling rate; input of all process parameters with off-range detection;
- Dispensation of the amount of sugar in the fermentor computed in relation to the NO<sub>3</sub> concentration of a raw extract;
- Generation of a print-out for calibration and NO<sub>3</sub> data points;
- Automatic output of statistical results (minimum, maximum, standard deviation, coefficient variation %) every hour, day and week during the duration of the experiment;
- Setting-off of an acoustic alarm generated by the micro-computer for indicating different off-range values or abnormal operations detected during regulation;

- Display of three different graphic screens. These screens may be selected by external adjustment of a digital pre-selector. Each screen continually gives information on the electrode drift and  $\text{NO}_3$  concentration of the extract as a function of the time elapsed;
- Automatic up-dating of the scale of each graphic representation according to the number of measurements recorded;
- Automatic transfer of graphic data onto the thermal printer once the screen is full;
- Display of sugar consumption at each sampling interval, hour, day and week during the duration of the experiment;
- Display of the minimum and maximum values of the standard and the extract in the last hour or day of operation.

The basic regulation principle involves the following factors :

The  $\text{NO}_3$  concentration in the raw extract is measured at a pre-selected sampling rate ranging from 5 to 27 minutes depending on the type of experiment being performed. Before any measurements are taken, the electrodes are automatically re-calibrated with a 10 ppm  $\text{NO}_3$  standard. Sugar is dispensed into the fermentor at a constant flow rate. The pump is fed by a 2-way magnetic valve connected to two different sterile containers. One of these containers is filled with a 40% glucose solution and the other with distilled water. The tube to the sugar container is open for a limited amount of time and this is controlled by the computer. The length of time depends on the  $\text{NO}_3$  level of the incoming raw extract.

The total opening time is divided up into sampling intervals, ie the valve is alternatively opened and closed and this ensures a homogenous distribution of the sugar. Figure 1 presents the principle of this dispensing mode.

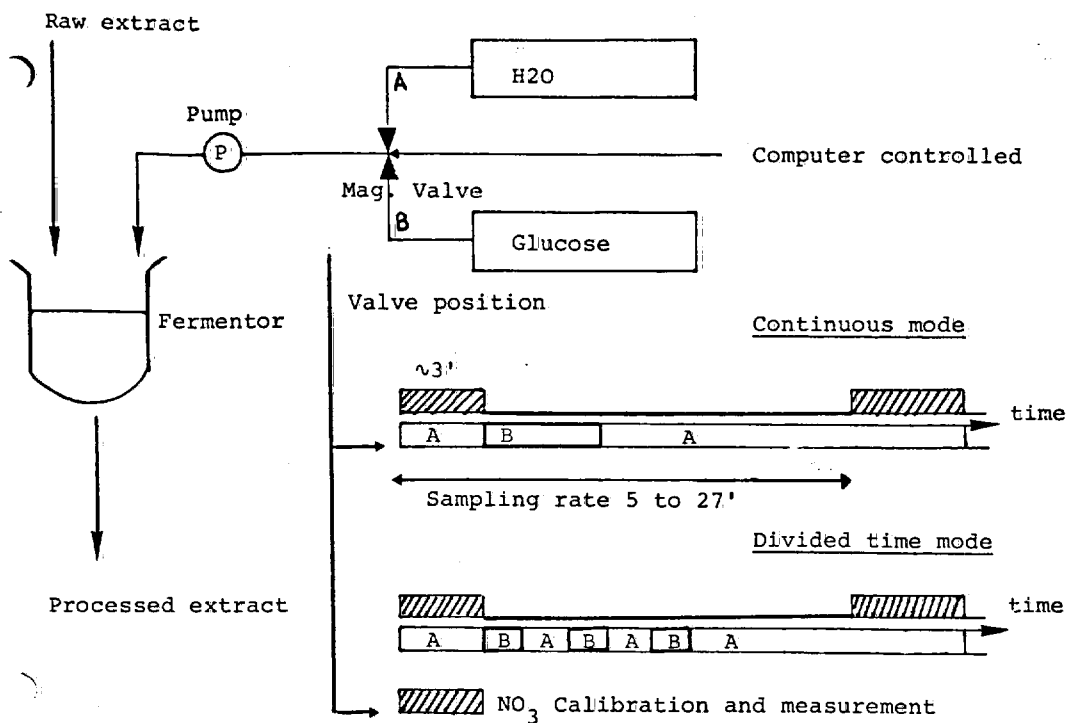


Figure 1 : Sugar dispensing mode

Different experiments are being carried out to test this type of NO<sub>3</sub> monitoring and to evaluate the different problems arising as regards electrode stability in a diluted tobacco extract. The power module, which operates the different valves and pumps uses opto-relays which greatly reduce the electrical interference.

The flexible and powerful HP 85 machine enables rapid development (about 15 working days) for small process controls.

(1) Monthly Report of August 1980

MIT/jud

*M. Thévoz*  
M. Thévoz

T S OSDENE  
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